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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/629,337	08/01/2000	Mark C. Fowler	0100.0001160	7287

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VEDDER PRICE KAUFMAN & KAMMHOLZ
222 N. LASALLE STREET
CHICAGO, IL 60601

EXAMINER

CHUNG, DANIEL J

ART UNIT PAPER NUMBER

2672

5

DATE MAILED: 05/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/629,337

Applicant(s)

FOWLER ET AL.

Examiner

Daniel J Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18 and 19 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 4-6, 13-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claims 1-19 are presented for examination. This office action is in response to the amendment filed on 3-6-2003. The objections to the title and claims have been withdrawn because of amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7-12 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al in view of Chang et al (5,040,130).

Regarding claims 1-2 and 9, Liu et al discloses that the claimed feature of a method for rasterizing primitives, comprising the steps of:

Determining if a primitive is totally outside [400d] a predetermined screen region ["display image area"; 410] or at least partially [400a,400b,400c] within the predetermined screen region, discarding the primitive if the primitive [400d] is totally outside the screen region, finding at least a portion of the primitive [400a,400b,400c] that is inside the screen region if the primitive is not totally outside the screen region,

filling [Fig 4b] only pixels in the portion of the primitive that is inside the screen region, repeating the method steps for each primitive of a plurality of primitives, and the primitive is a triangle [400]. (See Fig 4a, Fig 4b, col 5 line 2-18)

Liu et al does not specifically disclose that “filling only pixels in the portion of the primitive that is inside the screen region”. [filling a pixel after clipping] however, Chang et al clearly teaches that “Z-axis extraneous edges must, therefore, be separately processed subsequent clipping but before the area fill stage to remove any unwanted line segments”. (See col 17 line 31-35; also see Fig 3, Fig 7, Fig 10-12, Abstract, col 3 line 14-27, col 9 line 60-col 10 line 18, col 17 line 59-65, claims 12 and 17) It would have been obvious to one skilled in the art to incorporate the teaching of Chang into the teaching of Liu, in order to eliminate the unnecessary time of pixel filling process for the portion of primitives, where it will not be rendered in the final image, as such improvement is also advantageously desirable in the teaching of Liu et al for saving total processing time with maximum efficiency.

Regarding claims 10-12 and 16-17, claims 10-12 and 16-17 are similar in scope to the claims 1-2 and 9, and thus the rejections to claims 1-2 and 9 hereinabove are also applicable to claims 10-12 and 16-17.

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Regarding claim 3, Liu et al fails to teach that using X,Y coordinate system; and determining values of XSTART,YSTART,XEND,YEND for the primitive, Providing values of XLEFT,XRIGHT,YTOP,YBOTTOM for the screen region; and comparing the primitive values to the screen region values to determine if the primitive is totally outside the screen region. However, Chang et al discloses that a method for clipping a line segment boundary defined area [primitives] against a limiting plane [screen region] using the coordinate values of viewing region [42,152] and a primitive [40,150]. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a) It would have been obvious to one skilled in the art to incorporate the teaching of Chang et al into the teaching of Liu et al, in order to improve clipping system performance with less hardware and/or software by using clipping algorithms efficiently (See col 3 line 7-50 in Chang et al), as such efficient manner [using X,Y coordinate system] for clipping calculation is also advantageously desirable in the teaching of Liu et al for sorting/determining primitives based on its location [on/inside or off/outside from the viewing region] with faster time.

Regarding claim 7, refer to the discussion for claim 3 hereinabove, Change et al further discloses that the steps of: defining a start point on an edge of the primitive; determining if the start point is outside the screen region; edge walking the edge of the primitive from the start point to a boundary of the screen region; span walking a portion of the primitive inside the screen region and filling each pixel in the portion of the primitive that is inside the screen region. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a)

Regarding claim 8, Liu et al discloses that the primitive is a triangle and the start point is a vertex of the triangle. (See Fig 4a-b)

Allowable Subject Matter

Claims 18-19 are allowed.

Claims 4-6 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (Appropriate correction is required; please refer to the "claim objections" hereinabove)

The following is a statement of reasons for the indication of allowable subject matter: The present invention is directed to a computer system for rasterizing primitives. The above claims identifies the uniquely distinct features "Defining first and second x direction values of 0 and 1, respectively, for an x direction XDIR in the coordinate system as, respectively, left to right and right to left relative to the screen region, and defining first and second y direction values as 0 and 1, respectively, for a y direction YDIR in the coordinate system as, respectively, top to bottom and bottom to top; determining that the primitive is totally outside the screen area if at least one of the following is logically true given a start point X=XSTART and Y=YSTART fro the primitive; XDIR AND ((X<XLEFT) OR (XEND>XRIGHT)), XDIR' AND ((X>XRIGHT) OR (XEND>XLEFT)), YDIR AND ((Y<YTOP) OR (YEND>YBOTTOM)), YDIR' AND ((Y>YBOTTOM) OR (YEND<YTOP)). Incrementing Y if a first value, (((YDIR AND

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(Y>YBOTTOM)) OR ((YDIR' AND (Y<YTOP))), is logically true; Incrementing X if a first value, ((XDIR AND (X>XRIGHT)) OR ((XDIR' AND (X<XLEFT))), is logically true; repeating two above steps until the first and second values are not true, which identifies a beginning of a portion of the primitive that is inside of the screen region. The filling is finished when one of the following is true: (XDIR AND (X<XLEFT)), (XDIR' AND (X>XRIGHT)), (YDIR AND (Y<YTOP)), (YDIR' AND (Y>YBOTTOM))." The closest prior art, Liu et al (6,144,387) and Chang et al (5,040,130) discloses similar image processing system, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Chung whose telephone number is (703) 306-3419. He can normally be reached Monday-Thursday and alternate Fridays from 7:30am- 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael, Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

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or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

djc
May 5, 2003

A handwritten signature in black ink, appearing to be 'MR' followed by a long horizontal line.

**MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600**